

REMARKS

Claims 1-4 and 7-28 are pending with claims 1, 7, and 10 being independent. Claims 1-4 and 7 have been amended, claims 5 and 6 have been cancelled, and claims 8-28 are new.

Support for the new claims are found at least at the following locations:

Claim 8: Paragraph 41.
Claim 9: Paragraphs 22 and 39; and Figs. 8 and 9.
Claim 10: Paragraphs 38-40 and Figs. 8 and 9.
Claim 11: Paragraph 38 and Fig. 8.
Claim 12: Paragraphs 38-53; originally-filed claims 1-7; Figs. 8 and 9.
Claim 13: Fig. 8.
Claim 15: Paragraph 41; originally-filed claim 7; Figs. 8 and 9.
Claims 15-17: Paragraphs 39, 41, 46, 47, 49, and 50-53; originally-filed claim 7; Figs. 8 and 9.
Claim 18: Fig. 8.
Claims 19-21: Paragraphs 38-42; originally-filed claims 1, 4, and 7; Figs. 8 and 9.
Claim 22: Paragraphs 38-42; originally-filed claim 1; Fig. 8.
Claims 23-25 and 27: Paragraphs 44 and 45; originally-filed claim 2; Fig. 8.
Claims 26 and 28: Paragraphs 38-53; originally-filed claims 1-7; Figs. 8 and 9.

No new matter has been added.

Objections

The Examiner has objected to the specification for not stating how the heat sink is connected to the condenser. Applicant requests withdrawal of this objection because the subject matter of the claims is supported by the disclosure of the application as filed, as required by 35 U.S.C. §112, 1st paragraph and because applicant does not claim a heat sink connected to a condenser.

The Examiner has objected to the drawings under 37 CFR §1.83(a), alleging that the drawings must show heat sinks. Applicant has deleted all references to heat sink in the claims. For at least this reason, applicant requests withdrawal of this objection.

In response to the Examiner's second objection to the drawings, applicant has amended Figs. 1-7 to include the legend BACKGROUND ART. Accordingly, applicant requests withdrawal of this objection.

35 U.S.C. §112, 2nd Paragraph Rejection

The Examiner has rejected claim 1 as being indefinite. In view of applicant's amendment to claim 1, applicant requests withdrawal of this rejection.

35 U.S.C. §102(e) Rejection

Independent claim 7 relates to an evaporator for use in a heat transport system. The evaporator includes a primary wick defining a core, a vapor channel configured to receive vapor exiting the primary wick, a liquid channel within the core, and a secondary wick. The liquid channel is configured to receive liquid from a source external to the evaporator. At least a portion of the liquid channel is void of a wick. The secondary wick provides a flow path within the liquid channel of the core.

The Examiner has rejected claim 7 as being anticipated by U.S. Patent No. 5,944,092 (Van Oost). Applicant requests withdrawal of this rejection because Van Oost fails to describe or suggest a liquid channel within a core of an evaporator that is configured to receive liquid from a source external to the evaporator, where at least a portion of the liquid channel is void of a wick. In Van Oost, liquid from the reservoir 1 enters a core of the evaporator 2 through a capillary link 18, which serves as a liquid transport mechanism. See Van Oost at col. 5, lines 4-16 and Figs. 1, 4, and 7. As Van Oost explains, "heat transfer fluid comprised in the reservoir 1 circulates by capillarity in the capillary link 18 for reaching the porous material 5 of the evaporator." See Van Oost at col. 5, lines 16-26. Thus, though the capillary link 18 forms the only liquid transport mechanism within the core of the evaporator in Van Oost, no portion of the capillary link 18 is void of a wick. For this reason, claim 7 is allowable over Van Oost.

35 U.S.C. §103(a) Rejections

Independent claim 1 relates to a heat transport system including a condenser bank, a primary evaporator, a liquid return line, a secondary fluid line, a fluid reservoir, an auxiliary

evaporator adjacent the fluid reservoir, and a vapor line. The condenser bank includes one or more condensers. The primary evaporator includes a primary liquid port, a secondary fluid port, and a primary vapor port. The liquid return line is coupled to the primary liquid port to connect the primary evaporator to the condenser. The secondary fluid line is coupled to the secondary fluid port of the primary evaporator. The fluid reservoir is in fluid communication with the secondary fluid line. The auxiliary evaporator includes a fluid port in fluid communication with the fluid reservoir. The vapor line connects the condenser bank to the vapor output port of the auxiliary evaporator and to the primary vapor port of the primary evaporator.

The Examiner has rejected claims 1 and 4 as being obvious over Van Oost in view of U.S. Patent No. 5,303,768 (Alario). Applicant requests withdrawal of this rejection because Van Oost and Alario, alone or in combination, fail to describe or suggest a secondary fluid line coupled to a secondary fluid port of a primary evaporator. Van Oost's evaporator 2 merely includes two ports, a liquid in/gas out conduit 3 and a vapor port connected to a vapor line 6. See Van Oost at col. 4, lines 1-13 and Figs. 1 and 7. Van Oost's loop therefore does not include a secondary fluid line coupled to a secondary fluid port of an evaporator. Alario fails to cure the deficiencies of Van Oost. Alario's loop includes an evaporator having only two ports, a liquid in port that feeds into the opening 38 and a vapor out port that feeds into the vapor loop 16. See Alario at Fig. 3. Accordingly, Van Oost and Alario fail to describe or suggest a secondary fluid line coupled to a secondary fluid port of a primary evaporator. For this reason, claim 1 is allowable over Van Oost in view of Alario.

Claim 4 depends from claim 1 and is allowable for at least the reasons that claim 1 is allowable and for containing allowable subject matter in its own right. For example, claim 4 recites that the primary liquid port feeds into the core through a liquid bayonet. Neither Van Oost nor Alario describes or suggests a bayonet within the core of the evaporator.

The Examiner has rejected claim 2¹ as being obvious over Van Oost in view of U.S. Patent No. 5,816,313 (Baker). Claim 2 depends from claim 1, which was rejected as being obvious over Van Oost in view of Alario. Baker fails to cure the deficiencies of Van Oost to describe or suggest a secondary fluid line coupled to a secondary fluid port of a primary

¹ The Examiner also rejected claim 5, which is cancelled by this amendment. Thus, applicant does not include claim 5 in the following discussion.

evaporator. Like Alario and Van Oost, Baker's loop includes an evaporator 11 having a vapor out port that leads to the vapor line 18 and a liquid in port that receives liquid from the liquid line 36. See Baker at col. 4, line 31 –59 and Figs. 1a and 1b. For this reason, claim 1 is allowable over Van Oost in view of Baker. Claim 2 is allowable for at least the reasons that claim 1 is allowable and for containing allowable subject matter in its own right. For example, claim 2 recites that the system includes a back pressure regulator in the vapor line that prevents migration of vapor into the condenser bank. As the Examiner agrees, Van Oost fails to describe or suggest a back pressure regulator. Baker also fails to describe or suggest a back pressure regulator that prevents migration of vapor into a condenser bank. The Examiner points to the check valve 20 in the loop. However, as Baker explains, the check valve 20 is oriented to permit fluid flow into the condenser. See Baker at col. 4, lines 40-47 and Fig. 1a.

The Examiner has rejected claim 3² as being obvious over Van Oost in view of Baker and U.S. Patent No. 4,862,708 (Basiulis). Claim 3 depends from claim 1, which was rejected as being obvious over Van Oost in view of Alario. Basiulis fails to cure the deficiencies of Van Oost to describe or suggest a secondary fluid line coupled to a secondary fluid port of a primary evaporator. Like Alario, Van Oost, and Baker, Basiulis' loop includes an evaporator 12 having a vapor out port that leads to the vapor line 14 and a liquid in port that receives liquid from the liquid line 40. See Basiulis at abstract; col. 3, line 40 to col. 4, lines 63; and Fig. 1. For this reason, claim 1 is allowable over Van Oost in view of Baker and Basiulis. Claim 3 is allowable for at least the reasons that claim 1 is allowable.

New Claims

New claim 11 depends from claim 7 and is allowable for at least the reasons that claim 7 is allowable and for containing allowable subject matter in its own right. For example, none of the cited art shows a secondary wick of an evaporator configured to separate liquid and vapor within a core of the evaporator, as recited in claim 11.

New claims 8-10 depend from claim 1 and are allowable for at least the reasons that claim 1 is allowable and for containing allowable subject matter in their own right. For example,

² The Examiner also rejected claim 6, which is cancelled by this amendment. Thus, applicant does not include claim 6 in the following discussion.

claim 8 recites that the secondary fluid port is not in fluid communication with the primary liquid port. As discussed above, Van Oost and Alario are void of a secondary fluid port. Accordingly, Van Oost and Alario fail to describe or suggest a configuration in which a secondary fluid port is not in fluid communication with a primary liquid port.

New independent claim 12 relates to a heat transport system including a primary loop and a secondary loop. The primary loop includes a primary evaporator and a condenser. The primary evaporator has a primary wick defining a core and a vapor channel. The condenser is coupled with the primary evaporator by a liquid line in fluid communication with the core and a vapor line in fluid communication with the vapor channel. The secondary loop is configured to purge at least one of vapor and non-condensable gas bubbles from the core of the primary evaporator. The secondary loop includes a secondary fluid line in fluid communication with the primary evaporator, a secondary evaporator coupled with the condenser through the vapor line, and a reservoir in fluid communication with the secondary evaporator and coupled to the primary evaporator by the secondary fluid line. The cited art fails to describe or suggest the features of claim 12.

New claims 13-28 depend from claim 12 and are allowable for at least the reasons that claim 12 is allowable and for containing allowable subject matter in their own right. Independent consideration and allowance of these claims are requested.